

What is claimed is:

1 1. A method of forming a self-aligned contact hole suitable
2 for a semiconductor substrate having a pair of gate electrodes,
3 comprising the steps of:
4 forming a nitride etching stop layer over the gate
5 electrode and the semiconductor substrate;
6 forming an oxide insulating layer on the nitride
7 etching stop layer; and
8 plasma-etching the oxide insulating layer by an etching
9 gas containing C_2F_8 and CHF_3 so as to form a self-aligned contact
10 hole between the pair of gate electrode.

1 2. A method of forming a self-aligned contact hole as
2 claimed in Claim 1, wherein the oxide insulating layer is BPSG.

1 3. A method of forming a self-aligned contact hole as
2 claimed in Claim 1, wherein the oxide insulating layer is
3 silicon oxide formed by a reactive gas containing TEOS.

1 4. A method of forming a self-aligned contact hole as
2 claimed in Claim 1, wherein the nitride etching stop layer is
3 silicon nitride.

1 5. A method of forming a self-aligned contact hole as
2 claimed in Claim 1, wherein the nitride etching stop layer is
3 silicon oxy-nitride.

1 6. A method of forming a self-aligned contact hole as
2 claimed in Claim 1, wherein the etching gas further comprises
3 an inert gas.

1 7. A method of forming a self-aligned contact hole as

2 claimed in Claim 6, wherein the inert gas is argon gas.

1 8. A method of forming a self-aligned contact hole as
2 claimed in Claim 1, wherein the C_5F_8/CHF_3 mixture ratio of the
3 etching gas is between 0.4 and 0.75.

1 9. A method of forming a self-aligned contact hole
2 suitable for a semiconductor substrate having a pair of gate
3 electrodes, comprising the steps of:

4 forming a nitride etching stop layer over the gate
5 electrodes and the semiconductor substrate;

6 forming an oxide insulating layer on the nitride etching
7 stop layer; and
8 plasma-etching the oxide insulating layer by an etching
9 gas containing C_4F_8 and CHF_3 , so as to form a self-aligned contact
10 hole between the pair of gate electrode..

1 10. A method of forming a self-aligned contact hole as
2 claimed in Claim 9, wherein the oxide insulating layer is BPSG.

1 11. A method of forming a self-aligned contact hole as
2 claimed in Claim 9, wherein the oxide insulating layer is
3 silicon oxide formed by a reactive gas containing TEOS.

1 12. A method of forming a self-aligned contact hole as
2 claimed in Claim 9, wherein the nitride etching stop layer is
3 silicon nitride.

1 13. A method of forming a self-aligned contact hole as
2 claimed in Claim 9, wherein the nitride etching stop layer is
3 silicon oxy-nitride.

1 14. A method of forming a self-aligned contact hole as

2 claimed in Claim 9, wherein the etching gas further comprises
3 an inert gas.

1 15. A method of forming a self-aligned contact hole as
2 claimed in Claim 13, wherein the inert gas is argon gas.
1